formed between a second nitride semiconductor layer **14** and a third nitride semiconductor layer **15**. The sixth nitride semiconductor layer **18** is made of p-type GaN and has a thickness of 5 μm. The sixth nitride semiconductor layer **18** is doped with approximately 1×10^{19} cm^{-3} of Mg and has a carrier concentration of approximately 1×10^{18} cm^{-3}.

[0039] The sixth nitride semiconductor layer **18** functions as an etching stopper during wet etching for forming an opening in the third nitride semiconductor layer **15**. In the first embodiment, the undoped second nitride semiconductor layer **14** functions as an etching stopper during the wet etching. In this embodiment, the p-type sixth nitride semiconductor layer **18** stops wet etching without fail.

[0040] In addition, in this embodiment, the sixth nitride semiconductor layer **18** and a fourth nitride semiconductor layer **16** are both made of GaN. This eliminates a lattice mismatch occurring when the fourth nitride semiconductor layer **16** is re-grown on the sixth nitride semiconductor layer **18**. Accordingly, the crystallinity of the fourth nitride semiconductor layer **16** is enhanced. The sixth nitride semiconductor layer **18** and the fourth nitride semiconductor layer **16** preferably have the same composition as in this embodiment. In this case, the crystallinity of the fourth nitride semiconductor layer **16** is more effectively enhanced. However, these layers may have other compositions as long as a lattice mismatch at the growth interface is reduced. Specifically, the difference in lattice constant between the sixth nitride semiconductor layer **18** and the fourth nitride semiconductor layer **16** is preferably smaller than that between the second nitride semiconductor layer **14** and the fourth nitride semiconductor layer **16**.

Modified Example 1 of Embodiment 2

[0041] Now, a first modified example of the second embodiment will be described with reference to the drawing. FIG. **5** is a cross-sectional view showing a structure of a nitride semiconductor device according to the first modified example of the second embodiment. In FIG. **5**, components also shown in FIG. **1** are denoted by the same reference numerals, and thus description thereof will be omitted.

[0042] The nitride semiconductor device of this modified example includes a sixth nitride semiconductor layer **28** formed between the second nitride semiconductor layer **14** and the third nitride semiconductor layer **15** and made of p-type AlGaN. In this structure, the AlGaN layer having a large band gap forms a pn junction interface. Accordingly, gate leakage current is reduced.

[0043] In this modified example, the fifth nitride semiconductor layer **17** made of p-type AlGaN is formed in order to enhance the crystallinity of the fourth nitride semiconductor layer **16**. However, the fifth nitride semiconductor layer **17** may be omitted. The lattice mismatch between the fifth nitride semiconductor layer **17** and the sixth nitride semiconductor layer **28** is preferably small. Specifically, the difference in lattice constant between the sixth nitride semiconductor layer **28** and the fifth nitride semiconductor layer **17** is preferably smaller than that between the sixth nitride semiconductor layer **28** and the fourth nitride semiconductor layer **16**.

[0044] To reduce gate leakage current, the sixth nitride semiconductor layer **28** preferably has a band gap larger than that of the fourth nitride semiconductor layer **16**. The sixth nitride semiconductor layer **28** preferably has the same Al content as the second nitride semiconductor layer **14**. In this case, the sixth nitride semiconductor layer **28** is easily formed. However, the sixth nitride semiconductor layer **28** and the second nitride semiconductor layer **14** may have different Al contents. For example, the composition of the second nitride semiconductor layer **14** may be $Al_{0.15}Ga_{0.85}N$ and the composition of the sixth nitride semiconductor layer **28** may be $Al_{0.10}Ga_{0.90}N$.

Modified Example 2 of Embodiment 2

[0045] Now, a second modified example of the second embodiment will be described with reference to the drawing. FIG. **6** is a cross-sectional view showing a structure of a nitride semiconductor device according to the second modified example of the second embodiment. In FIG. **6**, components also shown in FIG. **1** are denoted by the same reference numerals, and thus description thereof will be omitted.

[0046] The nitride semiconductor device of this modified example includes a sixth nitride semiconductor layer **38** formed between the second nitride semiconductor layer **14** and the third nitride semiconductor layer **15**. The sixth nitride semiconductor layer **38** includes a first p-type layer **38**A made of p-type AlGaN and having a thickness of 5 nm and a second p-type layer **38**B made of GaN and having a thickness of 5 nm.

[0047] In the nitride semiconductor device of this modified example, the pn junction interface is made of the AlGaN layer having a large band gap so that gate leakage current is reduced. In addition, the fourth nitride semiconductor layer **16** and the second p-type layer **38**B have the same composition so that no lattice mismatch occurs at the growth interface during the epitaxial growth of the fourth nitride semiconductor layer **16**. Accordingly, the crystallinity of the fourth nitride semiconductor layer **16** is enhanced.

[0048] To reduce gate leakage current, the first p-type layer **38**A preferably has a band gap larger than that of the second p-type layer **38**B. The first p-type layer **38**A preferably has the same Al content as the second nitride semiconductor layer **14**. In this case, the first p-type layer **38**A is easily formed. However, the first p-type layer **38**A and the second nitride semiconductor layer **14** may have different Al contents. For example, the composition of the second nitride semiconductor layer **14** may be $Al_{0.15}Ga_{0.85}N$ and the composition of the second p-type layer **38**B may be $Al_{0.10}Ga_{0.90}N$.

[0049] The second p-type layer **38**B and the fourth nitride semiconductor layer **16** preferably have the same composition. In this case, the crystallinity of the fourth nitride semiconductor layer **16** is more effectively enhanced. However, these layers may have different compositions as long as a lattice mismatch at the growth interface is reduced. Specifically, the difference in lattice constant between the second p-type layer **38**B and the fourth nitride semiconductor layer **16** is preferably smaller than that between the first p-type layer **38**A and the fourth nitride semiconductor layer **16**.

Embodiment 3

[0050] Now, a third embodiment of the present invention will be described with reference to the drawing. FIG. **7** is a cross-sectional view showing a structure of a nitride semiconductor device according to the third embodiment. In FIG. **7**, components also shown in FIG. **1** are denoted by the same reference numerals, and thus description thereof will be omitted.